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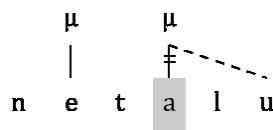
Eva Zimmermann, *Morphological length and prosodically defective morphemes* (Oxford Studies in Phonology and Phonetics 1). Oxford: Oxford University Press, 2017. Pp. xii + 345.

Reviewed by PAVEL IOSAD, University of Edinburgh

This is an extremely rich and rewarding book. It offers a challenging and innovative analysis of a wide range of tough morphophonological phenomena. Its central claim is simple and, in the words of the fictional Sir Humphrey Appleby, ‘very brave’: that there is no such thing as non-concatenative morphology. Via a consideration of numerous cases of what she calls ‘morphological length-manipulation’ (MLM), Eva Zimmermann argues that the concatenation of bases with chunks of segmental and suprasegmental material (‘prosodically deficient morphemes’) is sufficient to derive a whole range of effects, including both additive phenomena such as lengthening, and subtractive phenomena such as shortening and deletion. She gives an analysis of an impressive range of MLM phenomena in an Optimality Theoretic framework using Coloured Containment.

In Zimmermann’s account, MLM arises from competing constraints on how the suprasegmental and segmental material of an affix interacts with the suprasegmental and segmental material of the base. In general, there are four possible outcomes of such concatenation. First, the affix might have no visible effect on the suprasegmental structure of the base. Second, the suprasegmental material of the affix might associate to the existing segmental material, producing lengthening. Third, Zimmermann proposes the mechanism of *usurpation* of underlying suprasegmental material by affixal segments. The example in (1) shows vowel deletion in Yine: the suffix /-lu/ requires a preceding vowel to delete, so underlying /neta-lu/ ‘I see him’ maps to [net-lu].

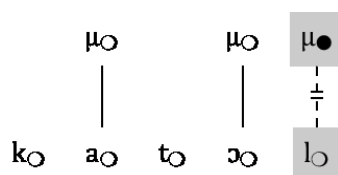
(1) Usurpation in Yine



Both vowels in the root are underlyingly moraic, but the vowel in the suffix /-lu/ is not. The constraint ranking forces the underlying association line between the second mora and the second vowel of the root to become phonetically invisible (crossed out), and inserts an association line between the root-final mora and the suffix vowel. The root-final vowel becomes phonetically invisible (shown by the shading), producing the effect of truncation.

A final possible outcome is *defective integration*, when affixal suprasegmental material is prohibited from being parsed via phonetically visible association lines. As a result, it is included in the output, but only in a phonetically invisible way, as shown in (2).

(2) Defective integration in Canela Krahô



The coloured circles indicate morphological affiliation. The suffix consists of a single mora, which attaches to the root-final consonant. However, the suffixal mora is *not* incorporated into higher-level suprasegmental structure, and is not phonetically visible — and neither is its segmental material. Hence, we get truncation of the final consonant.

Zimmermann explores the predictions of her analysis in six full-length chapters. Chapter 2 serves as a brief literature review and introduces the theoretical framework, including the workings of Coloured Containment, relevant restrictions on GEN, and the necessary constraints. Chapter 3 ('Subtractive MLM and Prosodically Defective Morphemes') demonstrates the effects of the mechanisms of mora usurpation and defective integration. Chapter 4 ('Prosodically Defective Morphemes and blocking') engages with the following major prediction: if nonconcatenative morphology is regulated by a set of violable OT constraints, then, depending on the phonological context, the nonconcatenative process may fail to apply. Zimmermann argues that this prediction is correct, supporting her argument by analyses of exceptionality in morphological length manipulation in several languages, and an insightful analysis of the blocking of vowel truncation in two varieties of Aymara. Chapter 5 ('Morpheme contiguity') explores a different facet of the proposed framework, which has to do with the existence of constraints that disprefer overlap of the exponents of different morphemes. This mechanism produces a range of effects, including some that are problematic for other versions of OT (such as long epenthetic vowels). Chapter 6 ('The complete empirical picture of MLM and the linearization of morphemes') is the most explicitly typologically oriented in the book. It presents the typological sample and the generalizations regarding the distribution of MLM processes in terms of which segments they target; in particular, Zimmermann finds no cases of morphological length manipulation that are 'non-local', i.e. that skip the edgemost elements on some tier (e.g. vowels, consonants, or syllables).

The typological angle is continued in the last substantive chapter ('A critical review of alternative accounts'), where Zimmermann considers how various other

proposals in the OT literature fare against her sample. She argues they all have various shortcomings — some are unable to account for attested phenomena, others overgenerate (in particular by predicting non-local patterns) — and that her approach provides the best typological fit.

Zimmermann's book combines a cutting-edge theoretical approach with exemplary care towards sourcing her data. She is explicit about the primary sources of data, and is careful to cite page numbers from original sources. The book also has numerous comments and footnotes flagging up the status of various exceptions and contradictions in the sources. It is perhaps still unusual — and very commendable — to find explicit discussion of typological sampling methods in a theoretically oriented work. The careful discussion in the text is supplemented by an 81-page online Appendix with much valuable additional information. It aims to comment on the productivity of the processes analysed in the text, as well as, in many cases, to pre-empt alternative analyses. (Given the value of the Appendix, it is regrettable that it is only mentioned in a footnote on page 3, and not well signposted: no URL appears in the print book, and there is no obvious link to it from Oxford Scholarship Online.)ⁱ In view of the scope of the book, it is perhaps inevitable that infelicities creep in: for instance, in the Russian data on page 35 several palatalization marks are omitted and incorrect glosses given (e.g. <korna> 'root-ACC.SG', *recte* <korn'a> 'root-GEN.SG'), or on p. 122, where a phonotactic restriction in Tohono O'odham on word-final sequences of a coronal consonant followed by a high vowel is illustrated by several examples (37-b), including the form [ta:p(a)], where the relevant sequence includes neither a coronal consonant nor a high vowel. It is to be hoped that no serious infelicities have influenced the analysis.

Zimmermann's book should be of interest to two broad constituencies. For specialists in theoretical phonology, it offers ample food for thought. It serves as an argument in favour of Containment over Correspondence in OT. Containment is crucial for Zimmermann's approach, because it enables apparent subtraction without deletion of phonological material — something that is less obviously possible with Correspondence, where non-pronunciation of underlying material is usually interpreted as deletion. This is not to say that Correspondence-based analyses of at least some kinds of subtraction are impossible (e.g. Iosad 2014, albeit in the segmental domain), but Zimmermann offers a clear empirical challenge to Correspondence Theory.

Another important issue raised is the role of underlying suprasegmental structure. Many of her analyses crucially rely on suprasegmental structure — especially morae — in underlying representations, even where moraicity appears predictable (e.g. with short vowels). The need for underlying moraic structure is often recognized when it is not predictable (cf. Morén 2001), but in general suprasegmental structure is often assumed to be derived via markedness constraints — indeed, many scholars within and outwith OT have argued that lexical contrasts in syllable structure are unattested. In Zimmermann's framework, lexical contrasts between, say, moraic and non-moraic vowels are routine, which raises a challenge to the assumption that suprasegmental structure is largely epenthetic. Given how successful Zimmermann is in accounting for her data using this device, it is worth taking this challenge seriously.

Zimmermann's book raises fascinating issues that go beyond the empirical scope of morphological length manipulation. To give a single example: as Zimmermann acknowledges, the mechanisms of concatenation and coloured containment should also be in play in the case of segmental affixation, including 'featural affixation' (Akinlabi

2011). Extending the analysis to this area seems like an obvious future direction.

However, there may be some important empirical or conceptual differences between the sub- and suprasegmental domains. For instance, Zimmermann argues that suprasegmental affixation cannot target non-peripheral pivots, and derives this restriction from her general theory of contiguity. It seems to follow that the same locality restrictions should hold in featural affixation. At face value, this prediction is incompatible with some of the most well-known cases of featural affixation, such as Chaha, where a suffixal [round] feature surfaces on the rightmost non-coronal consonant even if it is not the final consonant of the root. It remains to be seen whether such cases can be reanalysed as obeying locality (perhaps on an autosegmental tier), or whether they present a true empirical challenge to the theory.

The writing in the book is primarily pitched at theoretical phonologists. This is particularly obvious in Chapter 2, which is full of sometimes minute technical detail, some of it possibly taxing even for specialists: for instance, ‘Egalitarian Stratal OT’, first mentioned in passing on page 35, but not explained in much detail until page 70, or the discussion of various conditions such as the ‘No Kicking Condition’, which, while important, do not play a recurring rôle in the book. The book also uses many novel constraint formulations, given the many unorthodox structures and devices such as colour and phonetic (in)visibility of structure. Although this is of course necessary, the reader has to work their way through much unfamiliar technical detail, making the book perhaps less accessible to scholars less invested in formal phonological analysis. (A full list or index of constraints, possibly in another online appendix, would have been quite useful.)

Despite the sometimes forbidding amount of technical detail, it is to be hoped that Zimmermann's book finds a wide readership among scholars interested in the nature and theoretical importance of nonconcatenative morphological exponence. Non-concatenative processes, particularly subtractive ones such as shortening and truncation, are often interpreted as incompatible with an Item-and-Arrangement view of morphology. Indeed, it is probably fair to say that outside the Distributed Morphology framework most working morphologists would regard the morphemic analysis as straightforwardly false. For example, Anderson (2016:10) asserts: 'the empirical hypothesis represented by the morphemic view is not correct: real morphologies involve relations that fall outside the formal class of incremental, monotonic affixation operations.'

Zimmermann offers a defence of the concatenative view of morphology in the general framework of Generalized Nonlinear Affixation (Bermúdez-Otero 2012). The substance of this defence, as Zimmermann acknowledges, is not entirely new (e.g. Stonham 1994; Bye & Svenonius 2012), but the sheer scope of the book makes it a major contribution. Although the analysis is often complicated and relies on abstract phonological structure, it would be a mistake to view it as merely a rearguard action to save an otherwise convenient assumption that all morphological exponence is piece-based. In fact, Zimmermann's nuanced analysis shows that MLM processes exhibit patterns of blocking and allomorphy that are entirely parallel to patterns of 'classical' segmental affixation. This can be seen in her approach to issues such as the behaviour of forms with multiple prosodically deficient morphemes, the interaction of nonconcatenative and concatenative morphology, and blocking. Zimmermann shows that these phenomena can be derived from the interaction of the shape of the

morphemes involved and a single constraint ranking: in other words, morphological length manipulation shows the same patterns of phonologically conditioned allomorphy as those used to motivate the existence of phonological computation, and to investigate its nature. This is an important generalization all too easily lost within a process-based view, where segmental and non-segmental exponence is part of the morphological component rather than directly motivated within the phonological grammar.

Zimmermann raises a fair and important challenge to the argument that processual morphology cannot be insightfully analysed within a morphemic framework. Thus, this book is of significant theoretical and conceptual import well beyond the numerous interesting and challenging questions it raises for the phonologist.

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- Author's address: Linguistics and English Language, University of Edinburgh, Dugald Stewart Building, 3 Charles Street, Edinburgh EH8 9AD, United Kingdom*
pavel.iosad@ed.ac.uk

i As of January 2019, the Appendix is available at
<http://global.oup.com/booksites/content/9780198747321/>